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Original Article

Attitudes, Influences and Perceptions towards Plastic Surgery amongst Medical Students ☆

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ABSTRACT

Introduction: Plastic surgery is a dynamic and evolving field but remains poorly understood due to lack of knowledge, media misconceptions and recent changes to medical undergraduate curricula. To address issues around student interest and recruitment into the speciality, it is imperative to understand the factors influencing medical students and future clinicians.

Aims: To examine influences, interest and perceptions of plastic surgery amongst Scottish medical students and explore methods to increase undergraduate engagement.

Method: Cross-sectional survey distributed online via Scottish undergraduate medical school offices comprising 6 domains: demographics; career interest; perceptions, interests and influences in plastic surgery; curriculum and trainer views; understanding the role of a plastic surgeon; and undergraduate engagement.

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Results: A total of 193 students responded with no statistically significant relationship between year group, gender, and interest in plastic surgery. Phrases most strongly identified with plastic surgery included private practice, reconstruction and cosmetics. Placements, teaching staff and workshops/courses were found to influence perception of plastic surgery. Fortunately, only 6% of students encountered antagonism towards plastic surgery encompassing themes of negative stereotypes of surgeons and connotations surrounding cosmetic surgery. Importantly, many students were largely unaware of the range of common procedures undertaken by plastic surgeons. To overcome this lack of awareness and generate greater interest, students suggested greater plastics exposure, consultant-led teaching and workshops showcasing the specialty.

Conclusion: Medical students want varied, stimulating and flexible careers – something which plastic surgery can provide. However it seems the understanding of the scope of plastic surgery is poorly understood amongs future trainees. To increase uptake and interest, negative perceptions need to be addressed and greater engagement is required from medical school upwards.

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Introduction

Plastic surgery is an evolving, technique-driven specialty, not limited by anatomical site, pathological process or patient demographics[1], and with significant operative overlap with other surgical specialties. However, anecdotal evidence suggests that its scope is generally not well understood. Within an increasingly image-driven online society, media influence on doctors-in-training, as well as clinicians' onward referrals for plastic surgery, should not be underestimated. Specifically, there is limited evidence of specialty understanding at UK medical undergraduate level. One study reported that most medical students attributed the negative portrayal of plastic surgery to overriding associations with cosmetic surgery and financial rewards.[2] Such misconceptions can adversely impact on recruitment to plastic surgery, as well as clinician referral patterns. For example, only 11% of medical students at leading UK university considered a plastic surgeon most likely to perform a tendon repair.[1] The recent shift within UK medical curricula towards greater focus on general medicine and 'soft skills' is considered detrimental to the status of plastic surgery. Whereas before, plastics was included in the curriculum of 77% of UK medical schools (compulsory in 62%), now it is found in 71% (compulsory in 11%), and often delivered as single, sporadic lectures.[1,3] Reduced curricular presence is compounded by the shift from didactic, subject-based teaching to interactive, problem-based and student-centred learning.[4]

This study aims to examine the domains of influence, interest and perceptions of plastic surgery amongst Scottish medical students. It also sets out to explore ways of increasing undergraduate engagement with plastic surgery and to build greater understanding, uptake, competition and excellence within the specialty.

Method

The survey questionnaire was created using *JISC Online Surveys* and distributed via Scottish undergraduate medical school offices. Responses were gathered between 24/09/2018 and 19/11/2018, with

incomplete returns excluded from subsequent data analysis, using *IBM Statistical Product and Service Solutions (SPSS)* and *Microsoft Excel.*

The survey questions were drawn from the study aims and literature. The final version comprised 23 questions using Likert scales, multiple choice and free text, across the following 6 domains:

Demographics: gender, ethnicity, university, year group;
Speciality Interest: investigation of most important factors in overall future speciality selection;
Perceptions, Interests and Influences in relation to plastic surgery;
Curriculum: assessment of importance of plastic surgery within the undergraduate curriculum;
Role of Plastic Surgeon: examination of awareness of operative procedures undertaken within plastic surgery;
Undergraduate Engagement: exploration of ways to increase undergraduate interest.

Results

Demographics

The survey received 194 responses (31.6% male; 67.9% female; 1 Other). The year group distribution is shown in Table 1. Regarding ethnicity, the majority (78.8%) were White; others groups included Asian (8.3%), Chinese (4.7%), Black (3.1%), Mixed (3.1%), and Other (1.6%), with 1 participant preferring not to state their ethnicity.

Career Interest

When asked to identify the most important factors in future speciality selection, 'intellectual stimulation' (48.2%), 'variety' (33.9%) and 'flexibility' (37.8%) were uppermost. Other notable responses included 'working hours' (36.3%), 'personal development/learning opportunities' (26.9%) and 'focusing and developing skills within a defined area' (16.1%). Less common selections were 'job stability' (13%), 'community focus' (11.9%), 'pay' (11.9%), 'influence of role model' (11.4%), 'international focus' (7.3%), 'training length' (6.2%), 'research/academic opportunities' (5.2%), 'attitudes of superiors' (5.2%), 'attitudes of friends and family' (4.1%) and 'prestige' (3.1%).

Students were asked to rate the likelihood of a particular career after medical school, on a Likert scale from 1 to 10 with 1=definitely not and 10=definitely yes. The career range comprised 12 options: Anaesthetics, A&E, General Practice (GP), General Internal Medicine (GIM), Surgery, Paediatrics, Obstetrics & Gynaecology, Radiology, Psychiatry, Pathology, Public Health (PH) and Careers Outside Medicine (COM). Results are summarised in Table 2, showing cross-tabulation between year group and gender respectively. 'Other' gender excluded as only 1 student made tabulation impossible.

In Table 2, the green shading indicates those future career paths with most interest to survey respondents and red shading those of least interest. Amongst Intercalated Year and Year 1, Accident & Emergency was judged to be the most interesting future career choice. Year 2 and Year 3 students selected Paediatrics whilst Year 4 and 5 students perceived a future in GP to be of most interest. Excepting Intercalated Year and Year 2 students, the least popular specialty was PH. Intercalated Year students demonstrated low interest in Pathology whilst Year 2 students perceived COM to be of least

Table 1
Number of participants in each year group

Year group	Number of participants (%)
Year 1	39 (20.2)
Year 2	34 (17.6)
Year 3	42 (21.8)
Year 4	29 (15)
Year 5	30 (15.5)
Intercalated Year	19 (9.8)

Table 2
Interest in specialty as career choice by year group and gender.

		Anaes	A&E	GP	GIM	Surg	Paeds	O&G	Rad	Psych	Path	PH	COM
Inter	*Mean*	5.42	5.89	5.00	4.95	4.21	5.42	4.32	2.79	3.21	1.63	2.58	2.26
Year	*(SD)*	(2.48)	(2.49)	(2.71)	(1.93)	(3.01)	(2.43)	(3.06)	(1.96)	(2.25)	(0.90)	(1.87)	(1.59)
Year 1	*Mean*	4.92	5.82	5.59	4.67	5.31	5.51	5.31	4.54	5.15	4.18	3.62	2.59
	(SD)	(2.37)	(2.42)	(2.65)	(1.78)	(2.59)	(2.80)	(2.60)	(2.45)	(2.47)	(2.60)	(2.46)	(2.51)
Year 2	*Mean*	5.26	5.59	4.88	4.62	5.41	6.82	5.71	3.21	3.91	2.85	2.26	1.82
	(SD)	(2.49)	(2.52)	(2.93)	(2.05)	(2.95)	(2.61)	(3.04)	(2.00)	(3.50)	(2.22)	(1.90)	(1.47)
Year 3	*Mean*	5.33	5.76	4.95	5.26	5.43	6.00	5.10	2.69	4.02	2.38	2.19	2.33
	(SD)	(2.31)	(2.69)	(2.51)	(2.08)	(3.05)	(2.60)	(2.61)	(2.32)	(2.82)	(1.98)	(1.98)	(2.25)
Year 4	*Mean*	4.62	4.59	6.24	5.69	4.31	5.21	5.55	3.69	4.10	2.34	2.21	2.62
	(SD)	(2.29)	(2.31)	(3.08)	(2.06)	(3.20)	(2.80)	(2.62)	(2.49)	(2.54)	(2.09)	(1.82)	(2.31)
Year 5	*Mean*	5.97	5.13	6.67	5.83	4.57	5.50	4.23	3.20	3.73	2.33	2.23	2.43
	(SD)	(2.81)	(2.60)	(2.75)	(2.20)	(3.05)	(2.46)	(2.43)	(2.62)	(2.73)	(2.20)	(1.74)	(2.14)
Female	*Mean*	4.89	5.27	5.73	5.08	4.73	6.02	5.64	3.17	4.11	2.55	2.47	2.09
	(SD)	(2.42)	(2.56)	(2.87)	(2.02)	(3.01)	(2.62)	(2.53)	(2.37)	(2.59)	(2.17)	(1.96)	(1.83)
Male	*Mean*	6.03	5.98	5.13	5.31	5.51	5.38	3.92	3.84	4.1	3.03	2.72	2.90
	(SD)	(2.35)	(2.39)	(2.66)	(2.13)	(2.84)	(2.67)	(2.80)	(2.42)	(2.73)	(2.24)	(2.25)	(2.57)

SD = standard deviation, *Inter year* = intercalated year, *Anaes* = anaesthetics, *A&E* = emergency medicine, *GP* = general practice, *GIM* = general internal medicine, *Surg* = surgery, *Paeds* = paediatrics, *O&G* = obstetrics and gynaecology, *Rad* = radiology, *Psych* = psychiatry, *Path* = pathology, *PH* = public health and *COM* = careers outside medicine. 1=definitely not, 10=definitely yes and green shading indicating career path with most interest and red shading indicating career path with least interest in relation to year group and gender.

interest to them. Paediatrics was the first choice amongst female respondents for future training; for male students, Anaesthetics held the greatest interest. The speciality with least interest for females and males respectively was COM and PH

Perceptions, Interest and Influences in Plastic Surgery

Respondents were asked to rate the likelihood of embarking on plastic surgery as a career on a Likert scale from 1 to 10 with 1=definitely not and 10=definitely. Figure 1 demonstrates the range of interest in plastic surgery across all respondents. Table 3 shows cross-tabulation between year group and gender respectively. Other gender excluded as only 1 student made tabulation impossible.

Figure 1 indicates that 66/193 (34.0%) had a positive opinion and 105/193 (54.4%) a negative opinion towards plastic surgery as a vocation. The average interest towards plastic surgery across all survey respondents was 4.40. Table 3 indicates that the highest mean score was 4.77 (Year 1), whereas the lowest was 4.07 (Year 5). Interest in plastic surgery amongst males was 4.56 with females scoring

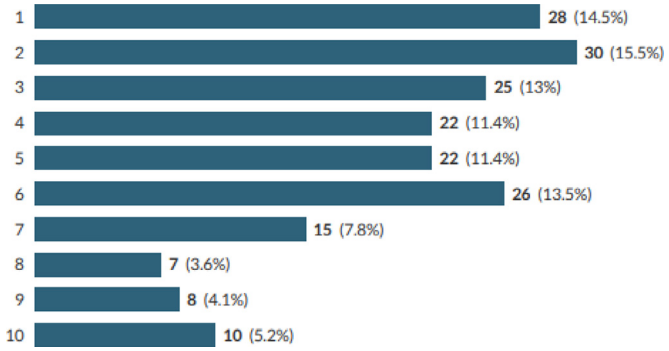

Figure 1. Likelihood of future selection of plastic surgery using a Likert Scale. *1* = definitely not and *10* = definitely yes.

Table 3
Likelihood of future selection of plastic surgery: cross-tabulation by Year Group and Gender using a Likert scale.

Category		Plastic Surgery
Intercalated Year	*Mean (SD)*	4.42 (2.21)
Year 1	*Mean (SD)*	4.77 (2.40)
Year 2	*Mean (SD)*	4.47 (2.76)
Year 3	*Mean (SD)*	4.10 (2.64)
Year 4	*Mean (SD)*	4.62 (2.81)
Year 5	*Mean (SD)*	4.07 (2.75)
Female	*Mean (SD)*	4.33 (2.68)
Male	*Mean (SD)*	4.56 (2.45)

SD = standard deviation, 1=definitely not and 10=definitely yes.

their interest at 4.33. The statistical significance of these results was calculated using the Kruskal–Wallis test with the null hypothesis retained, indicating no relation between interest in plastic surgery and year group ($p=0.744$, $p \leq 0.05$) and interest in plastic surgery and gender ($p=0.717$, $p \leq 0.05$).

Phrases most often associated with plastic surgery were ‘private practice opportunities’ (56%), ‘reconstruction’ (48.2%) and ‘cosmetics’ (46.6%). Other noteworthy answers included ‘good pay’ (41.5%), ‘competitive’ (25.9%) and ‘interesting’ (19.7%). Phrases eliciting fewer responses included ‘intellectually challenging’ (11.9%), ‘variety’ (11.4%), ‘stressful’ (8.8%) and ‘life-changing’ (8.8%). Expressions that had only single-digit responses pertained to issues such as ‘professional status’, ‘research opportunities’, ‘isolated working’, ‘boring profession’ and ‘reduced intellectual stimulation’. Interestingly, no respondents selected ‘poor pay’.

When asked which factors might most influence their perception of plastic surgery, students responded ‘placements within the speciality’ (69.9%), ‘lecturers and medical school staff’ (50.8%) and ‘workshops or courses’ (44.6%). Other notably strong responses included ‘role of media’ (43.5%), ‘medical school curriculum’ (32.6%), ‘other doctors’ opinions and views’ (31.1%) and ‘views of colleagues’ (15%). Responses such as ‘parental views’ (9.3%) and ‘plastic surgery societies’ (3.1%) did not feature prominently as opinion influencers.

Curriculum Views

When asked to rate the importance of plastic surgery exposure as part of the medical school curriculum on a Likert scale, 109/193 (56.4%) respondents felt that plastic surgery inclusion was important to varying degrees (>5) (Figure 2). 32/193 (16.6%) were neutral and 52/193 (26.9%) felt it was unimportant to varying degrees (<5). The average importance of plastic surgery inclusion in the curriculum was 5.83.

When asked, most respondents (83.9%) reported that they had not encountered negativity towards plastic surgery from medical school staff or doctors, 20/193 (10.4%) reported ‘don’t know’ and 11/193

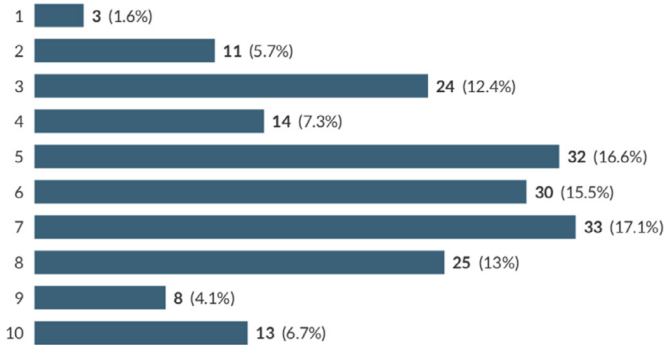

Figure 2. Importance of plastic surgery in medical school curriculum using a Likert Scale. *1* = extremely unimportant and *10* = extremely important.

Table 4
Thematic analysis of 'negative' free text responses

General themes	Responses
Negative implications of cosmetic surgery	4
Negative stereotypes of surgeons	3
Money driven nature of specialty	1
Negative experience of private practice	1
Very competitive specialty	1
Plastic surgery in relation to popular media figures	1
Not important and can be easily replaced	1

(5.7%) reported 'yes'. For the latter, respondents were then asked to elaborate using free text responses, which were thematically categorised by the researcher (Table 4).

The most common theme was the negative implications of cosmetic surgery. Whilst respondents commented that cosmetic procedures such as breast augmentation or 'tummy tucks' represented an ineffective use of resources, some felt that, in the specific context of reconstruction, plastic surgery was life-changing and positive for the patient. Answers generating single responses included the specialty being too money-focussed, being too competitive, being too closely associated with popular media figures and also being an easily replaceable specialty.

Understanding the Role of the Plastic Surgeon

Students were given a list of 9 surgical procedures within plastic surgery: hand and wrist joint replacement, skin cancer excision, rhinoplasty, diseased lymph node removal, breast asymmetry, labiaplasty, vaginal reconstruction, gender reassignment surgery and hypospadias. They were then asked to select procedures which they thought might be performed by plastic surgeons. The range of procedures chosen tended towards the reconstructive, cosmetic and gender reassignment aspects of the specialty (Figure 3).

Undergraduate Specialty Engagement

Lastly, students were asked how increased interest in the specialty might be generated during their time at medical school (Figure 4).

The most popular method was more clinical experience during medical school at 89.1%, followed by the suggestion that more plastic surgeons teaching (65.8%). Other answers which drew responses are listed in Figure 4. Free text responses (n=6) included better advertising of research, audit, shadowing, placement and self-selected module opportunities along with greater teaching on the reconstructive aspect of plastic surgery as opposed to the aesthetic aspect. Students also reported that when

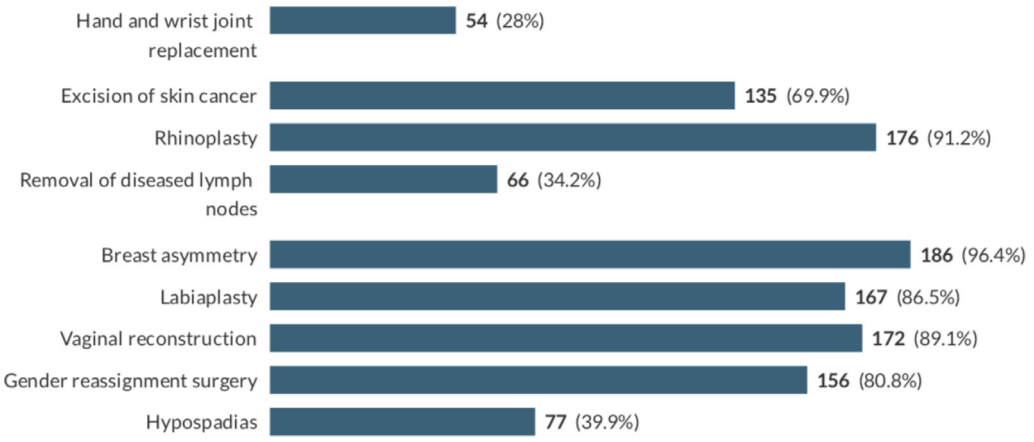

Figure 3. Respondent perception of typical plastic surgery procedures.

teaching on gender reassignment, there should be 'less political correctness' and that when lecturing regarding prominent facial features or deficiencies, they should address these issues more sensitively and be careful with language choice.

Discussion

Undergraduate Perception of Plastic Surgery

Interest in Surgery and Plastic Surgery

In this study, surgery did not prove the most popular career choice of specialty amongst respondents, and over half of them had a largely negative opinion of selecting plastic surgery. Unexpectedly, despite assumed clinical exposure within the field, year of study and gender had no statistically significant correlation with interest in plastic surgery as a future vocation. In the context of surgical selection, the introduction of single-centred selection in 2011 has allowed us to more readily study application trends within core surgical training.[5] Alarmingly, overall interest in pursuing a surgical career has declined rapidly over the last 10 years.[6] Predictably this decline has been mirrored within plastic surgery. This is due to a multitude of factors, including but not limited to: undergraduate experience; work-life balance; perceived competition; lack of surgical mentors; and applications abroad or outside medicine.[6] Attempts have been made in the past by organisations such as BAPRAS to create one-day undergraduate courses, which have assisted in increased familiarity of plastic surgery amongst undergraduates.[7] It therefore remains more critical than ever that we regenerate interest in plastic surgery and encourage the excellence that comes with increased competition. As such, there have been forward changes to increase the appeal and flexibility of a surgical career, including the creation of the Improving Surgical Training scheme by the Royal College of Surgeons.

Understanding the Role of Plastic Surgery

'Cosmetic' procedures of plastic surgery were most prominent in respondents' minds, with breast asymmetry and rhinoplasty being recognised most commonly, 96.4% and 91.2% respectively. However, only 34.2% of students knew that plastic surgeons were involved in the removal of diseased lymph nodes, despite this being a commonplace procedure within the field. Similarly, only a minority of respondents were aware of the role of plastic surgery in hypospadias and hand/wrist joint replacements.

At the same time, students reported that they most valued 'intellectual stimulation' (48.2%) and 'variety' (33.9%) when choosing a specialty, arguably those very factors which plastic surgery offers in abundance. Plastic surgery has been described as 'the last bastion of general surgery'[1] because of its diversity, unbounded by anatomical site, pathological process, or patient subgroup. There exists

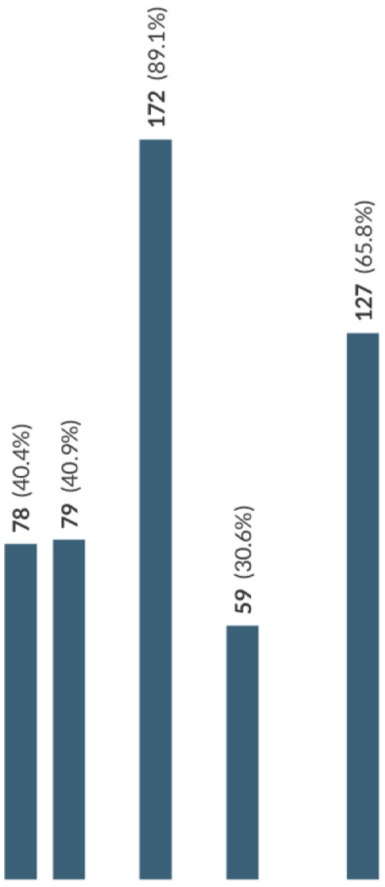

Figure 4. Bar chart showing the number of students selecting each method of engagement.

much scope for variety and subspecialisation.[8] Whilst this versatility promotes innovation, it also fuels confusion within the minds of the public, professional colleagues and policy makers. Even at a higher level, uncertainty exists concerning the scope of plastic surgery training within the NHS, particularly regarding aesthetic surgery. This study confirms that the range of procedures is still poorly understood amongst medical students and clinicians alike.

Associations with a Career in Plastic Surgery

This study demonstrates that the terms 'private practice opportunities' and 'cosmetics' lead associated descriptions of the profession, whilst 'variety', 'intellectually challenging' and even 'stressful' were seldom chosen. As few as 11.9% associated plastic surgery with being 'life changing', and only 56.4% perceived it worthy of inclusion in the undergraduate curriculum. Through a variety of factors, there is a skewed modern-day perception of plastic surgery amongst the public, medical students and practising clinicians. An apparent veneer of glamour and narcissism might detract from the challenges faced within the profession, particularly with rising patient expectations and increasing risk of unregulated litigation[2,9]. At an undergraduate level, this perception can detract from the true value of the role of a plastic surgeon.

The Role and Influences of Plastic Surgery in the Undergraduate Syllabus

Aspiring clinicians make their career choices based on a multitude of factors with undergraduate experience being a major influence. Understanding students' motivations and uncovering favoured teaching techniques can best ensure that plastic surgery rediscovers its appeal.[6] This study reaffirms published data where plastic surgery ranks below other specialties in terms of importance in delivering care to patient.[10]

The Inclusion of Plastic Surgery within the Curriculum

The most influential teaching modality for students remains clinical exposure within the field. Whilst there are curricula time constraints and geographical differences in service provision, this should not preclude a more versatile and inclusive approach to plastic surgery teaching nationwide.

The study findings suggest that increasing faculty involvement in teaching is a successful way of generating interest within the specialty. Previous data support this claim and even acknowledge 'early clinical exposure and interaction between plastic surgeons and students' the biggest predictor of a student selecting this as a career.[2] The broad nature of the field allows teaching involvement across multiple systems. Just a few examples are as follows: skin structure and function, surgical patient assessment, anatomy, specific system conditions and surgical skills. Clearly, there should be more engagement in undergraduate education by plastic surgeons and a willingness on their part to teach and promote the field. Changes in modern teaching styles and the extensive scope of plastic surgery support greater integration into the curriculum.

Only 40.9% of students thought that more extra-curricular workshops would be beneficial at generating interest in the field, perhaps reflecting prior negative experience. Educational and regulatory organisations, e.g. Royal College of Surgeons, BAPRAS and BAAPS have urged the creation and monitoring of formal plastic surgery teaching at undergraduate level.[11] This call should extend to holding more extra-curricular workshops and events. Studies of single-day undergraduate courses and faculty-led interactive careers evenings have demonstrated to increase student career interest, knowledge and skills for within the field.[7,12] Additionally, these faculty interactions provide networking and mentoring opportunities.

As mentioned earlier, the mandatory incorporation of plastic surgery within the curriculum has decreased over recent years and, even when included, often appears as single disjointed lectures.[1,3] Improving teaching delivery generates interest in the profession, whilst driving competition and high standards of future applicants. Arguably, educating future primary care clinicians about the scope of plastic surgery at an undergraduate level is an efficient way of improving referral patterns for future practice.[13]

Summary and Future Recommendations

1) This study confirms current knowledge that medical students do not have a good understanding of the breadth of services within plastic surgery. Whilst cosmetic and aesthetic procedures are well recognised, there seems little appreciation of the full scope of subspecialisation and everyday operations.
2) A significant proportion of medical students have a negative image of plastic surgeons. The main connotations associated with the discipline include private practice, cosmetics and good pay, whereas the variety, challenge and importance of the work are less well understood. This study supports evidence that the media have a significant level of influence upon undergraduate students.
3) Common misconceptions and poor understanding can impact on the following: career uptake; competition and excellence within the field; future research; integrity and value of the specialty; and future referral patterns.
4) This study reaffirms growing evidence that students are placing a greater emphasis on lifestyle, flexibility and working hours when choosing specialty training. Therefore, for plastic surgery to remain competitive, strategies need to be employed to maintain a high level of interest and competition.[2]
5) To counteract declining uptake, there is a growing imperative to engage students at undergraduate level via enhanced integration within the curriculum and greater engagement by BAPRAS, BAAPS and other plastic surgery faculties. Liaison with key educators, curriculum guidance, workshops and possibly more junior roles within their organisations would be highly beneficial in generating more positive teaching and practical experiences.[2,11]

Conclusion

Amongst undergraduates, the perception that plastic surgery is a predominantly financially driven cosmetic discipline has a detrimental effect on its overall image. There exists poor knowledge of the scope of subspecialisation and a lack of appreciation of the challenges within the field. Issues surrounding negative perceptions need to be addressed with more plastics exposure, governing body input and consultant-led undergraduate involvement. Medical students want a varied, stimulating and flexible career; something which plastic surgery can provide. Whether it is to drive excellence and research within the field or simply to improve inter-specialty referral patterns, it is clear that more engagement is required at an undergraduate level.

Conflict of Interest Statement

The authors can confirm there is no conflict of interest.

Funding

The authors can confirm there are no study sponsors.

Ethical Approval

Ethical approval to undertake this study was obtained from the University of Dundee School Of Medicine Research Ethics Committee – SMED REC 045/18.

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